

WHAT IS CLAIMED IS:

1. An air intake structure of an engine, comprising:  
a first intake air passage and a second intake air passage formed by branching of an intake air passage disposed downstream from a throttle valve;

a plurality of intake ducts branched from a downstream end portion of said first intake air passage and a downstream end portion of said second intake air passage and having a downstream side connected to a plurality of cylinders provided in said engine;

a first communication element capable of establishing communication between a neighborhood of said downstream end portion of said first intake air passage and a neighborhood of said downstream end portion of said second intake air passage; and

a control element for controlling said first communication element in accordance with an operating state of said engine,

said air intake structure further comprising a second communication element which, upstream from said first communication element in a flowing direction of intake air, can bring said first intake air passage and said second intake air passage into communication, and

said control element being adapted to control said first communication element and said second communication element in accordance with the operating

state of said engine.

2. The air intake structure of the engine according to claim 1, wherein

a sectional area of said first intake air passage and said second intake air passage at a site where said second communication element is disposed is rendered larger than a sectional area of upstream end portions of said first intake air passage and said second intake air passage.

3. The air intake structure of the engine according to claim 1, wherein

said first intake air passage and said second intake air passage are separated as independent intake air passages by a partition portion.

4. The air intake structure of the engine according to claim 1, wherein

said second communication element displaces at least a part of said partition portion to bring said first intake air passage and said second intake air passage into communication.

5. The air intake structure of the engine according to claim 4, wherein

said second communication element has a rotatable

valve mechanism provided in said partition portion, and brings said first intake air passage and said second intake air passage into communication by rotation of said valve mechanism.

6. The air intake structure of the engine according to claim 5, wherein

said valve mechanism comprises a partition plate for unclosing and closing an opening formed in said partition portion, and a rotating shaft disposed rotatably and having said partition plate mounted thereon, and

said rotating shaft is installed, with an axial direction thereof being nearly identical with a streamline direction of intake air.

7. The air intake structure of the engine according to claim 4, wherein

said second communication element is provided at an upstream end portion of said partition portion.

8. The air intake structure of the engine according to claim 7, wherein

when said first intake air passage and said second intake air passage are brought into communication by said second communication element, a partition length of said first intake air passage and said second intake air

passage is shortened.

9. The air intake structure of the engine according to claim 7, wherein

when said first intake air passage and said second intake air passage are brought into communication by said second communication element, a sectional area of upstream end portions, in the flowing direction of intake air, of said first intake air passage and said second intake air passage is increased.

10. The air intake structure of the engine according to claim 9, wherein

an intake sectional area on a downstream side of said second communication element is rendered larger than an intake sectional area on an upstream side of said second communication element.

11. The air intake structure of the engine according to claim 1, wherein

said control element brings said first communication element into a non-communication state and also brings said second communication element into a communication state, when a revolution speed of said engine is in an intermediate revolution speed region.

12. The air intake structure of the engine according

to claim 11, wherein

said control element brings said first communication element and said second communication element into a non-communication state when the revolution speed of said engine is in a low revolution speed region, and brings said first communication element into a communication state when said revolution speed is in a high revolution speed region.